

THE TABULATE CORAL FAMILIES SYRINGOLITIDAE HINDE, ROEMERIIDAE
POČTA, NEOROEMERIIDAE RADUGIN AND CHONOSTEGITIDAE LECOMPTE,
AND AUSTRALIAN SPECIES OF *ROEMERIPORA* KRAICZ

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Abstract

The genera *Roemeria* Edwards & Haime, *Roemeripora* Kraicz (and its possible synonym *Vaughanites* Paul 1937, non Woodring 1928), *Roemerolites* Dubatolov, *Armalites* Chudinova, *Pseudoroemeripora* Koksharskaya, and *Bayhaium* Langenheim & McCutcheon are considered to have syringoporid affinities and to form a family Roemeriidae Počta.

The three Australian Lower or early Middle Devonian species *Michelinia progenitor* Chapman, *Syringopora thomii* Chapman and *Roemeria ocellata* Hill are revised, transferred to *Roemeripora*, and considered probably synonymous.

Pseudoroemeria Chekhovich and *Syringoporinus* Sokolov are possibly better grouped with *Troedssonites* Sokolov than in the Roemeriidae.

Neoroemeria Radugin and *Thecostegites* Edwards & Haime have syringoporid affinities and are grouped in the family Neoroemeriidae Radugin while *Chonostegites* Edwards & Haime, also with syringoporid affinities, is considered the sole member of its family Chonostegitidae Lecompte. *Haimeophyllum* Billings is shown to be a synonym of *Chonostegites*. *Gorskyites* Sokolov, *Neosyringopora* Sokolov and *Roemeripora wimani* Heritsch form a group of Upper Carboniferous and Permian tabulates that appears to deserve syringoporid subfamily status.

Syringolites Hinde is considered more closely related to *Favosites* than to *Syringopora*, and is treated herein as the only genus in the family Syringolitidae Hinde of the Favositoidea.

Introduction

The genera discussed in this paper form only minor elements in their associated faunas, and some species are represented in collections by only very few individuals. Consequently, range of variation within species is not well known, and this naturally reduces certainty about taxonomic relations. Fifteen specimens presently available from the one quarry, that at Cave Hill, Lilydale, Victoria, give us the opportunity to assess the variation between them.

In searching for the correct generic assignment for these species, we have studied borrowed thin sections and photographs of several relevant type specimens and reviewed all relevant literature.

The family position of many of the genera involved has been the subject of much discussion in the literature, and in essence turns mainly upon which characters are to be regarded as favositid and which syringoporid. Historical summaries have been given by Weissmerl 1897, Lecompte 1936, Heritsch 1939, and Chudinova 1964.

For brevity, we have set out the conclusions of our study in the form of a series of diagnoses of families and genera and have given our reasons for so doing in the discussion following each taxon. The description of the Australian material will be found under the genus *Roemeripora*.

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The registered numbers of specimens used in this paper are prefixed by the initials of the institutions in which they are housed, as follows: BM(NH) — British Museum (Natural History), London; GSV — Geological Survey of Victoria, Melbourne; MU — University of Melbourne; NMV — National Museum of Victoria, Melbourne; SU — University of Sydney; UQ — University of Queensland, Brisbane; UT — University of Tasmania, Hobart.

Superfamily FAVOSITOIDEA Dana 1846

Nom. transl. Hill & Jell, herein (*ex* FAVOSITIDAE Dana 1846); = order FAVOSITIDA Wedekind 1937, *nom. transl.* Sokolov 1950 and *nom. correct* Sokolov 1962 (*ex* *FAVOSITACEA Wedekind 1937); includes MULTISOLENIDA Fritz 1950.

DIAGNOSIS: Tabular, hemispherical, nodular or branching, cerioid coralla typically without coenenehyme; corallites slender, with mural pores; septa short, equal, spinose, variable in number; tabulae typically complete.

RANGE: Upper Ordovician to Permian.

Family SYRINGOLITIDAE Waagen & Wentzel 1886

Nom. transl. Sokolov 1950 (*ex* SYRINGOLITINAE Waagen & Wentzel 1886).

DIAGNOSIS: Tabular to hemispherical coralla with tightly contiguous prismatic corallites, the common walls with mural pores; septa represented by very short spines developed in radial rows on the upper surface of tabulae; tabulae infundibuliform, their downturned axial edges forming a persistent axial tube which may bear spines and be crossed by small flat tabellae.

RANGE: Silurian of Canada and Gotland, ? Lower Devonian of the Kuznetsk Basin, Siberia.

REMARKS: The cerioid corallum with circular mural pores through the common wall is a characteristically favositid feature. Infundibuliform tabulae, with the successive downturned axial edges forming an axial tube, are characteristically syringopoid; it is true that Tripp (1933) has shown that some *Favosites forbesi* Edwards & Haime from the Visby beds of Gotland develop groups of tabulae each with a median notch, but the notches are not prolonged into an axial tube. However, the axial tube of syringopoids is commonly diverted to open at a mural pore through which it is placed in communication with the similarly diverted axial tube of the neighbouring corallite. No such diversion is seen in *Syringolites*. Also, all known Ordovician and Silurian syringopoids are fasciculate with connecting tubules. On the other hand, the development of spines in radial rows on the tabulae is rare to absent in the Favositoidea.

* Wedekind (1937) in classifying the Foraminifera consistently used the suffix -oidea for orders and -acea for suborders. He did not specifically name as orders or suborders the coral taxa to which he gave these same endings, but we consider it reasonable to assume that he was consistent here also.

Obviously there can be no certainty that the Syringolitidae are correctly placed under the Favositoidea, but they seem to us better referred there than to the Syringoporoidea.

Genus *Syringolites* Hinde 1879

Syringolites Hinde 1879, p. 244.

TYPE SPECIES (by original designation): *S. huronensis* Hinde 1879, 'not uncommon in the Niagara dolomite (Wenlock), near Manitouwaning, Great Manitoulin Island, Lake Huron.' This we take to refer to the Manitoulin Dolomite of Llandoveryan age.

DIAGNOSIS: Cerioid coralla with mural pores through the common walls of the small corallites; with septal spines developed in radial rows on the upper surfaces of the tabulae; tabulae widely spaced, infundibuliform, the axially downturned edges forming a continuous and regular axial tube crossed by small flat or saucered tabellae; the axial tube not diverted to open into a mural pore.

RANGE: Type species, Llandoveryan (Manitoulin Dolomite) of Ontario, Canada. *S. kunthianus* (Lindström 1896) Silurian (Visby marls to Hemse Group) of Gotland, and Wenlockian (upper part of Jaani horizon) of Estonia. Dubatolov (1963) doubtfully referred to the genus some subcylindrical coralla from the Siegenian? upper part of the Krekov beds of the Kuznetsk Basin, Siberia.

REMARKS: Lindström (1896) and others considered *Roemeria* a synonym of *Syringolites*. But the thick walls of *Roemeria*, the slight distal divergence of its corallites, and the occasional diversion of the axial tubes of neighbouring corallites to communicate through a mural pore leads us to regard it as a distinct genus, referable to the Syringoporoidea.

Syringolites huronensis Hinde 1879

(Pl. 16, fig. 1-4)

Syringolites huronensis Hinde 1879, p. 246.

LECTOTYPE (here chosen): BM (NH) R19949, marked 'a' in rectangular blue edged label, G. J. Hinde coll., Manitouwaning, Manitoulin Island, Georgian Bay, Ontario, Canada. This we take to be the original of Hinde's 1879, fig. A on p. 246 and have figured herein Pl. 16, figs. 2a, 2b. BM (NH) R19950, from the same locality, and similarly marked 'b', we take to have been used for the drawing of the calice in Hinde's fig. B, and BM (NH) R19947, similarly marked 'c', we take to have been used for the drawing of Hinde's fig. c. We have sectioned this last specimen and give photographs in our Pl. 16, fig. 3a-f. Other, probably syn-type, material from the G. J. Hinde collection from the same locality is now in the BM (NH) collections, numbered R19946, 19948. R19983-4, 19986-91 are however referred not to Manitouwaning, but to Manitoulin Island only. All the material is silicified. Hinde gave 'Niagara dolomite (Wenlock)' as the origin of the type material; this we interpret as the Manitoulin Dolomite of Llandoveryan age.

DIAGNOSIS: Tabular cerioid *Syringolites*; each corallite with centric or sub-centric wide and persistent axial tube formed by the junction of the downturned axial parts of each tabula with the tabula below.

DESCRIPTION: The corallum is cerioid, growing in large flattened masses with a basal epitheca. The corallites are polygonal, commonly six-sided, each side wall somewhat wavy in the vertical plane, and small, 1.8 to 2.5 mm in diagonal diameter in presumably adult corallites. The common walls are thin (0.14 mm)

and silicification has obscured their original microstructure, though traces of the median dark line, are visible here and there in the sections. Mural pores are rounded, not very regularly arranged in two roughly alternating longitudinal series on each side wall of average width. They range in diameter from 0.13 to 0.2 mm. No pore-diaphragm has been noted, but some of the pores may have a low raised rim, as indicated, perhaps too strongly, in Hinde's fig. D. No evidence of separation of neighbouring corallites has been found so that there is never any sign of connecting tubules. Septa are represented on the upper surfaces of the tabulac (including the inner surfaces of the axial tube) by short spinules arranged in radial rows. Hinde estimated the number of these rows to reach the axial tube as being about 12, with shorter rows between. Where they could be counted there seem to be twelve raised areas, on which the radial rows of septal spinules are based, each area separated from its neighbour by a narrow and shallow groove; on some of the radial areas the main radial series of spinules may be supplemented by additional irregularly alternating smaller spinules, as in some *Cystiphyllum* (Pl. 16, fig. 1). We have not been able to establish any consistent alternation of long and short septa. The spinules on the tabulae are circular in cross-section and blunt, tapering from 0.15 to 0.10 mm at their base to 0.05 to 0.03 mm at their distal ends; they are seldom longer than 0.2 mm. In the axial tubes some of the spinules are thinner—0.05 at their base tapering to a sharp point, and longer—up to 0.28 mm. Spinules are very rare and small on the side walls between tabulae. The tabulae are large, simple, infundibuliform plates, subhorizontal or slightly arched at the periphery, then curved downwards rather sharply to form the axial tube. Supplementary tabellae are seldom seen. The distance between tabulac ranges from 0.5 to 1.0 mm, the general impression being one of fairly even spacing. The axial tube is formed by the cohesion of the downturned axial prolongation of one tabula with the underlying tabula at its sharp change of slope. The tubes are fairly constant in width, ranging from 0.5 to 0.8 mm; and are placed centrally or subcentrally in the corallite. No instance of a divergence of a tube to open into that of a neighbouring corallite through a mural pore has been noted, though carefully searched for. Horizontal or gently saucered tabellae may cross the tube and are widely spaced.

REMARKS: The species *Roemeria kunthiana* Lindström (1896, Pl. 2, figs. 19-25; Pl. 3, fig. 26-30) from the late Llandoveryan to early Ludlovian (Visby marls to Hemse Group) of Gotland differs in its sometimes lumpy to subhemispherical form and, more significantly, in the commonly excentric position of its axial tube. Septal spinules are noted springing from the inner surface of the wall as well as from the upper surfaces of the tabulae which are more closely spaced than in the type species, and some of which are incomplete. The corallites have an average diameter of 2 mm. Klaamann (1964, Pl. 21, fig. 1-5) has described this species from the Wenlockian upper Jaani stage of Saaremaa, Estonia.

S.? *indistinctus* Dubatolov (1963, Pl. 21, fig. 2a-v) from the Siegenian? Krekov Beds of the Kuznetsk Basin, Siberia, has a much less perfect axial tube and can only very doubtfully be referred to the genus.

Superfamily SYRINGOPOROIDEA Nicholson 1879

Nom. transl. Hill & Jell, herein (*ex* SYRINGOPORINAE Nicholson 1879; = order SYRINGOPORIDA Sokolov 1947, *nom. correct.* Sokolov 1962 (*pro* SYRINGOPORACEA Sokolov 1947)).

Family ROEMERIIDAE Pošta 1904

ROEMERIIDAE Pošta 1904 (*fide* Sokolov 1955, p. 324).

DIAGNOSIS: Encrusting, discoid or branching; corallites adpressed and prismatic

with mural pores or canals, but more or less divergent peripherally, when external transverse wrinklins in the thickened walls outline tunnel-like spaces into which wall pores open, so that communication between neighbouring corallites is retained; wall microstructure syringoporoid—primarily of 'fibres' of CaCO_3 normal to the epitheca, and including septal spinules in longitudinal and radial rows; the spinules may project into the tabularium and also may be developed on tabulae; in diagenesis the fibrous nature may be obscured, and, additionally, growth lamination may be so emphasized that 'lamellar' sclerenchyme results, in which the septal spinules appear as holacanth; tabulae thin, horizontal or concave or infundibuliform, with the notches in places elongated proximally to form a syrx, which may divert from the axis to a mural pore so that communication is attained between the tubes of some neighbouring corallite.

RANGE: Latest Ludlovian or Skalian to Lower Permian.

REMARKS: We have herein split this family off from the Syringolitidae which we leave in the Favositoidea on the grounds that *Syringolites* itself shows only one syringoporoid feature—the axial syrx—and this we take to be a homeomorphic development. Its thin walls and its numerous rounded mural pores are favositoid, the syrx never diverts to communicate with that of a neighbour through a mural pore, and so far as we have been able to ascertain its corallites never diverge peripherally. On the other hand the genera which we have grouped in the Roemeridae have in common the features we have set out in the diagnosis above.

Genus *Roemeria* Edwards & Haime 1851

Roemeria Edwards & Haime 1851, p. 152, 253.

TYPE SPECIES (by monotypy): *R. infundibulifera* (Goldfuss), Edwards & Haime 1851, p. 152, 253; = *Calamopora infundibulifera* Goldfuss 1879, p. 78, Pl. 27, figs. 1a, b. Middle Devonian; Eifel district and Bensberg, Germany. Lecompte (1936, Pl. 12) figured the only one of Goldfuss' syntypes now at Bonn (Goldfuss Collection No. 258) and remarked that possibly the thin section figured by Lindström (1896, Pl. 3, fig. 30) was cut from a second syntype loaned to Lindström by Schlüter. Schlüter (1889, p. 100) stated that neither of the two syntypes then in Bonn were labelled 'Bensberg', so it must be presumed that the original of Lecompte's 1936, Pl. 12, which we must take to be the lectotype, was from the Eifel. This specimen was chosen as lectotype by Chernyshev (1951, p. 69).

DIAGNOSIS: Cake-shaped cerioid coralla, with unequal small polygonal corallites of which some may cease to join tightly at the periphery of the corallum, giving in places circular calices; walls thickened, with sporadic mural pores; septal spines absent, or perhaps represented by radial dark lines in the wall thickening; tabulae simple, infundibuliform, a very slender axial or excentric tube being formed by the proximally produced parts of the funnels.

REMARKS: Lecompte, in studying Goldfuss' specimen, described the calcareous lining to the median dark line as showing two zones of microstructure—a peripheral zone vaguely fibrous, perpendicular to the axis, and an axial more or less longitudinally laminate. He thought this a character of generic value. We are unconvinced that the lamination is significant; it might be artefactual. We think the appearance of the walls in Goldfuss' specimen could well have been induced by diagenesis of a syringoporoid type of wall, formed primarily of 'fibres' of CaCO_3 at right angles to the epitheca.

In the upper right-hand sector of Lecompte's 1936, Pl. 12, fig. 1a, there is

an appearance as if the axial tubes of two neighbouring corallites are in communication through a mural pore. Such communication is a syringoporida feature, and if actually present indicates that *Roemeria* is better referred to the Syringoporoidea than to the Syringolitidae.

However, Leecompte's Pl. 12, fig. 1e, suggests as does Lindström's 1896, Pl. 3, fig. 30, that offsets originate in the calice of the parent and not from the mural pores or connecting tubes as in the Syringoporoidea. Calical budding seems to occur also in the specimens referred to *Roemeria infundibulifera* by Chernyshev (1951, p. 69, Pl. 18, figs. 3, 4) from the Eifelian of the R. Salairka, Kuznetsk Basin. In the Gotland species *S. kunthianus* the offsets figured arise intermurally at the angle between 4 corallites.

Schlüter (1889, Pl. 9, figs. 2, 3 and 4) figured syntypes of his *R. minor* from the Middle Devonian of the Schmidheim syncline in the Eifel showing diverging cylindrical corallites and also communication of the axial tubes of neighbouring corallites through mural pores. This latter feature is figured also by Nicholson (1889, figs. 2, 3 on p. 435). Both of these characters are typically syringoporida. In *Syringolites* only the lumina outside the axial tube are placed in contact by the mural pores—not the tubes themselves.

Roemeria macropora Stepanov (1909, Pl. 1, fig. 5a-b (not seen by us) from the [?Lower] Devonian, north-east Pre-Balkhash, is considered by Dubatolov (1963, p. 170) to be a species of *Pseudoroemeria* Chekhovich 1960, *q.v.* below).

R. maxima Chernyshev (1951, Pl. 18, fig. 5-6) from the Eifelian of the R. Chumysh in the Kuznetsk Basin, might be either *Roemeria* or *Roemeripora* from the illustrations.

RANGE: Middle Devonian of Germany and Eifelian of the Altai-Sayan, Central Asia.

Genus *Chonemblema* Say in Keating 1824

TYPE SPECIES (by monotypy): *C. intricata* Say in Keating 1824, p. 253, Pl. 14, figs. 1, 1a [? Silurian or ? Devonian, ? Great Lakes Region], N. America.

Keating's description and figures suggest that the type species is referable to one of the genera *Syringolites*, *Roemeria*, *Roemeripora*, or *Syringopora*. The figures alone suggest *Syringolites*. On the other hand, Keating described the corallites as cylindrical and separated by nearly the distance of their diameters—features that suggest *Roemeripora* or *Syringopora*. He stated that the 'lateral openings' were few in number and the 'siphuneles' (axial tubes) of neighbouring corallites occasionally inosculated through the walls. These characters recall *Roemeripora* rather than *Syringolites*, but the wide separation of the corallites indicated above is commoner in *Syringopora* than in the Roemeriidae.

Professor J. W. Wells who drew our attention to this genus has been unable to establish the location of the type specimen or its provenance. We treat the generic name as a *nomen oblitum*.

Genus *Roemeripora* Kraicz 1934

Roemeripora Kraicz 1934, p. 45.

POSSIBLE SYNONYMS (discussed separately below): *Vaughanites* Paul 1937, p. 110, *non* Woodring 1928, p. 200 (a Miocene gastropod); *Roemerolites* Dubatolov 1963, p. 58; *Armalites* Chudinova in Dubatolov 1963, p. 62; Chudinova 1964, p. 63; *Pseudoroemeripora* Koksharskaya 1965, p. 88; *Bayhaium* Langenheim & McCutcheon 1959, p. 99.

TYPE SPECIES (by original designation, Kraicz 1934, p. 45): *Roemeria bohémica* Barrande in Pořta 1902, p. 262, Pl. 102, figs. 9, 10; Pl. 111, fig. 21-25; Pl. 116, figs. 11, 12, from the Lower Devonian [Pragian] f2 [Upper Koneprus Limestone], Koneprus, Czechoslovakia.

DIAGNOSIS: Corallum cerioid; corallites prismatic or, when slightly divergent, cylindrical; peripheral stereozone present transversely wrinkled externally (when corallites not tightly adpressed); septal spines holacanthine, in lamellar sclerenchyme of stereozone in numerous radial longitudinal series and on tabulae; tabulae thin, complete, or more commonly incomplete, horizontal, coneave, or infundibuliform grouped in relation to pore-canals (or to connecting tubules that lie in the external wrinkles of the wall). Offsets arise from the openings of pore-canals.

RANGE: Lower Devonian of Czechoslovakia, the Kuznetsk Basin, Victoria, New South Wales and New Zealand; Lower Middle Devonian of Queensland; Upper Middle Devonian of Kuznetsk Basin; ?Lower Carboniferous of Novaya Zemlya. We do not consider *Roemeripora wimani* Heritsch 1939 from the Lower Permian of Spitzbergen and of Devon Island to be congeneric with *R. bohémica*; see below.

REMARKS: Weissermel (1897), Pořta (1902) and Kraicz (1934) have all given descriptions of specimens from the Koneprus Limestone which we take to be conspecific with the lectotype (chosen Dubatolov 1963, p. 60, as the specimen figured by Pořta 1902, Pl. 102, figs. 9, 10). These differ from *Roemeria infundibulifera* in the greater emphasis on the not uncommon divergence of corallites, in the relative abundance of mural pores, in the grouping of the tabulae in relation to the mural pores and in the strong development of septal spinules, which in *Roemeripora bohémica* as in other species of the genus are nearly always visible in and projecting from the thick walls. In *Roemeria infundibulifera* the offsets originate in the peripheral parts of the calices whereas in *Roemeripora bohémica*, as in all the Australian specimens referred to *Roemeripora*, they commonly develop from the openings of the pore-canals. The transverse external wrinkling of the walls mentioned by Pořta and very apparent in the Australian species described below, has not been mentioned as occurring in *R. infundibulifera*.

While the range of variation in *R. infundibulifera* remains unknown, we cannot be sure that *Roemeria* and *Roemeripora* are not the same genus, but for the time being we consider them to be separate, with the characters given in the diagnosis above.

It seems to us that *Roemeria minor* Schlüter 1889 is probably better considered to be a species of *Roemeripora* as above defined, and we tentatively transfer it thereto.

Dubatolov (1963, Pl. 22, fig. 3; Pl. 23, fig. 1) has referred to *R. bohémica* specimens from the Krekov beds of the Kuznetsk Basin, Siberia. Dubatolov (1959, Pl. 19, fig. 2; Pl. 20, fig. 2; Pl. 72, fig. 3) described *R. tomensis* sp. nov. from the ?Zaruba beds of Givetian age in the Kuznetsk Basin. He did not mention any divergence of the corallites, but his Pl. 19, fig. 2a, shows it.

The specimens from the Lower Devonian Malobachat beds and the early Middle Devonian Salairka beds figured by Bulvanker (1958, Pl. 77, fig. 2; Pl. 78, fig. 1-2) as *Loyolophyllum breviseptatum* sp. nov. appear to be *Roemeripora*, though the photographs show no signs of external wrinkling of the walls, and but little evidence of divergence of the corallites.

Roemeripora aisenbergi Vasilyuk (1960, p. 27, Pl. 2, fig. 1-1c; Pl. 3, fig. 1-1d) from C₁'a (= Zone d'Etrocungt) of the Donetsk Basin has relatively thin-walled

corallites that do not diverge, and that have incomplete as well as complete tabellae peripherally.

Syringopora favositoides Vaughan (1915, p. 34, Pl. 5, figs. 2a, b) from the Lower Carboniferous δ horizon (top of C₂ or bottom of S₁ *sublaevis* limestone) of Avesnes district, north-eastern France, was named the type species of *Vaughanites*, a new subgenus of *Syringopora*, by Paul 1937, but this name was pre-occupied by Woodring (1928, p. 200) for a Miocene gastropod. A thin section of the holotype E11401, Sedgwick Museum, of *S. favositoides* is refigured herein, Pl. 1, fig. 5. Its slender polygonal corallites are almost contiguous, the axial tubes are fairly regularly developed and open into one another through mural pores and short connecting irregular tubules. It might well be included in *Roemeripora*; its fine septal spinules and the rather regular nature of its axial tube are very similar to those of both *Roemeripora* and *Syringopora*.

Smirnova (1957) referred new species from Novaya-Zemlya to *Roemeripora*—*R. terraenovae* (Upper Famennian or Lower Tournaisian), *R. galovanovi* (Tournaisian), *R. arctica* and *R. fenitima* (Visean-Namurian).

Roemeripora clara Kačanov (1964, p. 28, Pl. 7, fig. 4) from the base of the upper Viséan of the eastern slopes of the southern Urals has incomplete peripheral tabellae, large mural pores and corallites divergent in parts of the corallum.

Heritsch (1939) referred an early Permian species to *Roemeripora*—*R. wimani* Heritsch (1939, Pl. 8, fig. 4; Pl. 17, figs. 4, 5; Pl. 20, figs. 23, 24; Pl. 21, fig. 1-3) from Spitzbergen (Gips Hook, and Isfjord, Gips Bay), as also did Padgett (1954)—Inner Isfjorden, Harker (1960, Pl. 14, figs. 6, 7)—Beleher Channel Formation, Grinnell Peninsula, Devon Island, Canadian Arctic and Dubatolov (1963, p. 170)—southern Timan. This species shows very numerous tabellae, including an irregularly developed peripheral series resembling dissepiments; it also shows grouping of other tabellae in relation to the mural pores. It lacks the peripheral stereozone of *Roemeripora bohemica*, and its fine texture and the abundance of tabellae suggest that it might perhaps be more closely related to the Carboniferous and Permian genera *Gorskyites* Sokolov (1955) and *Neosyringopora* Sokolov (1955) than to *Roemeripora*; owing to lack of Permian material we cannot pursue this possibility further. Sokolov considered his two genera to be syringoporids, but their tabellar structure suggests the possibility of relationship to the micheleniids.

Roemeripora progenitor (Chapman) 1921

(Pl. 17, fig. 1-6; Pl. 18, fig. 1-3; Pl. 19, figs. 1, 2, 4, 5)

Michelinia progenitor Chapman 1921, p. 220, Pl. 9, figs. 7, 8.

? *Syringopora thomii* Chapman 1921, p. 222, Pl. 10, fig. 14. Holotype (by original designation) NMV P13193 with thin sections P17898-9, Loyola, near Mansfield, Victoria. Figd. Chapman 1921, Pl. 10, fig. 14; herein Pl. 17, fig. 2a-d.

Roemeria ocellata Hill 1950, p. 159, Pl. 9, figs. 35a, b. Holotype (by original designation) MU 1955, with thin sections 642, 643, upper Murrindal Beds, Rocky Camp, Buchan, Victoria. Figd. Hill 1950, Pl. 9, figs. 35a, b; herein Pl. 18, figs. 4a, b.

? *Roemeria* sp. Hill 1950, p. 159, 160, Pl. 19, figs. 36a, b.

? *Roemeria thomii* (Chapman); Philip 1962, p. 169, text-fig. 3, Pl. 20, figs. 3, 4.

Roemeripora sp. cf. *ocellata* (Hill); Hill, Playford & Woods 1967, p. d8, Pl. D4, figs. 5a, b.

HOLOTYPE (of *R. progenitor* by original designation): NMV P13189 with thin sections P17896-7, Cave Hill, Lilydale, Victoria; figd. Chapman 1921, Pl. 9, figs. 7, 8; herein Pl. 17, fig. 1a-d.

DIAGNOSIS: Cerioid or partly fasciculate coralla of large corallites each with thick peripheral stereozone that may be deeply transversely wrinkled externally;

septa represented by holacanthi in vertical and horizontal series embedded in the lamellar sclerenchyme of the stereozone, but some are based on the tabulae; tabulae thin, incomplete, infundibuliform or with syrx that may be crossed by transverse tabellae; communication between neighbouring tabularia or frequently between neighbouring syrxes, by sparse pore-canals in cerioid parts of the coralla or by connecting tubules that lie within the transverse external folds of the stereozone in fasciculate parts. New individuals arise through the pore-canal or from an incompletely connecting tubule.

DESCRIPTION OF THE HOLOTYPE: This is a mainly cerioid fragment of a colony, the adult corallites are 4 mm or a little less in diameter, and are laterally contiguous for the most part, but not tightly so, most of them having partly rounded, partly polygonal transverse sections; narrow gaps between corallites occur only partly filled by coarse transverse rugae projecting from the stereozones of neighbours. In cerioid parts the common wall is about 0.75 mm thick; in the fasciculate parts the stereozone is about 0.3 mm thick where wrinkles are not present but may be considerably more where a wrinkle is transected. The transverse wrinklins are clearly seen to the left of centre in the lower half of Pl. 17, fig. 2d. The epitheca of each corallite shows as a dark line, and the tissue of the wall inside the epitheca consists of sclerenchyme showing very fine growth lamination interrupted by holacanthi (spiniform trabeculae in which no fibrosity can be distinguished) that rise almost from the epitheca, are directed inwards and slightly upwards, and project very slightly beyond the inner surface of the stereozone. They are arranged in numerous longitudinal series, and those of neighbouring series are approximately opposite. Some short, thin holacanthi are observed based on the tabulae. The tabulae are predominantly incomplete, but a completely transverse tabula is seen just below the position of a pore-canal.

The thin, incomplete tabellae are arranged like one or two series of dissepiments in the peripheral parts of the corallites, leaving an axial part like the syrx of syringoporoids that may be crossed by small thin tabellae; the syrx would appear not to be continuous nor always axial throughout the corallite, but to curve and open into and through one or other of the pore-canals so that the syrxes of neighbouring corallites become continuous. Such pore-canals are large and sparse, only one being intersected in the three thin sections prepared from the holotype.

OTHER SPECIMENS FROM LILYDALE: Fourteen specimens of *Roemeripora*, in addition to the holotype of *R. progenitor*, are now known from Lilydale and these show considerably more variation than was previously suspected. In eleven, the dimensions of the corallites are approximately the same as in the holotype, the average corallite diameter within a corallum varying from 3.0 to 4.0 mm. There is a wide range in the proportion of contiguous and partly or wholly prismatic corallites to free cylindrical corallites. In internal characters and microstructure the eleven all appear conspecific with the holotype and all show pronounced external wrinkling of the wall. The thickness of the common wall in the cerioid parts of these specimens varies from 0.7 to 1.5 mm; in the fasciculate parts the stereozone ranges from 0.26 to 0.66 mm where wrinkles are absent and up to 1.33 mm where wrinkles are prominent. Variation in the spacing of the pores is considerable; in NMV P15799 they are developed at definite levels within the corallum. The development and spacing of the holacanthi in vertical and horizontal series within the stereozone are very irregular. Spines are sometimes developed within the syrxes and the connecting pore-canals. The tabulae in some coral-

lites are sparser than in the holotype with one series developed so that their inner edges flank the syrxinx. In specimens with closely spaced connecting pores tabellae become crowded between pores and both their upper and lower edges are based on the inner surface of the stereozoone. The microstructure of the stereozoone and spines and the mode of increase of the corallum are syringoporeoid in all specimens.

Three specimens from Lilydale, NMV P15784, P26041-2, are distinguished by the large size of their corallites, which are predominantly prismatic except near and at the upper surface of the colony where they grow free, becoming cylindrical (Pl. 18, fig. 3a). The average diameter of adult corallites within a corallum is 5.2 to 6.8 mm. The common wall in these specimens varies from 0.8 to 1.3 mm in width. In all other features they are within the range of variability shown by the specimens with smaller corallites and qualitative distinction cannot be made between the two groups.

REMARKS ON SPECIMENS FROM OTHER LOCALITIES: The holotype of *R. ocellata* Hill from the Upper Murrindal Limestone of Rocky Camp, Buchan, in its predominantly cerioid habit and size of corallite resembles the three larger specimens from Lilydale. It differs only in that the common wall between corallites is much thinner: 0.5 mm compared with 0.8 to 1.3 mm in the Lilydale specimens. Two additional specimens from the lower Murrindal Limestone at Rocky Camp are now known to us. In corallite size (average diameter 4.4 mm), in proportion of contiguous, prismatic corallites to free cylindrical corallites and in thickness of the common wall between contiguous corallites (0.66 to 0.9 mm), they are intermediate between the holotypes of *R. progenitor* and *R. ocellata*.

UQ F36329, a specimen with large corallites from the Douglas Creek Limestone of Douglas Creek, Clermont, Queensland, figured as *Roemeripora* sp. cf. *ocellata* in Hill, Playford & Woods (1967, Pl. D3, figs. 5a, b) has a predominantly prismatic habit but some corallites have curved faces. The corallites vary from 3.5 to 5.3 mm, average 4.5 mm in diameter and the width of the common wall between contiguous corallites varies from 0.6 to 1.0 mm. Another specimen (UQ F50606) from the Jesse Limestone of the Limekilns, 17 miles north of Bathurst, New South Wales, shows the same habit and the same corallite size. Neither specimen shows distinctive characters and both appear intermediate between the holotypes of *R. progenitor* and *R. ocellata*.

Thus the variation in the material at hand suggests that *R. ocellata* (Hill) is synonym of *R. progenitor* (Chapman) and that the stratigraphic range of *R. progenitor* may be considerable.

Only the holotype of *Syringopora thomii* Chapman is known to us from Loyola. Cylindrical corallites predominate, contiguous in places. It closely resembles several of the group of specimens from Lilydale characterized by small corallites, in all save the slightly larger diameters (3.6 to 4.7 mm, average 4.0 mm) of its corallites. It seems to us very probable that, when a range of material from Loyola becomes available, *S. thomii* will prove to be a synonym of *R. progenitor*. Philip (1962, p. 169, text-fig. 3, fig. 3-4) referred to *Roemeria thomii* two specimens that have average corallite diameters of 4.5 mm and are predominantly cerioid, although some corallites have curved sides and are loosely united.

In a small specimen (GSV 47767) from the Cave Limestone, Loc. 97, Buchan, Victoria, figured as *Roemeria* sp. by Hill (1950, Pl. 9, figs. 36a, b) the corallites are much smaller (adult diameters from 2.5 to 3.5 mm) than in the other Buchan specimens of *Roemeripora*. In corallite diameter it compares closely with one of

the Lilydale specimens (NMV P13875) that we have referred to *R. progenitor*. A poorly preserved specimen (UQ F10273) from the Garra Formation, Welling-ton district, New South Wales, is very similar to this Buchan specimen and both are somewhat doubtfully referred to *R. progenitor*.

One specimen, SU P28200, Pl. 19, fig. 4, collected and loaned to us by Dr B. Webby of the Sydney University from the Emsian or early Couvinian Reef-ton Limestone near Reefton, New Zealand, is similar to the group of Lilydale speci-mens with the smaller corallites.

RANGE: Lower-? Middle Devonian of eastern Australia and New Zealand. The species is known from the Coopers Creek Formation at Tyers, the Loyola Lime-stone, the Lilydale Limestone, the Buchan Caves Limestone and the Murrindal Limestone of Victoria, the Jesse Limestone and Garra Formation of New South Wales, the Clermont Limestone of Queensland and the Reefton Limestone of New Zealand.

Phillip & Pedder (1968) regard the Coopers Creek Formation and the Loyola and Lilydale Limestones as early Siegenian, and the Buchan Caves, Murrindal Limestones and Garra Formation as late Siegenian? to early Emsian. However, we consider the evidence accords equally well or better with a Pragian (late Siegenian to early Emsian) age for the first three limestones, and an Emsian or early Couvinian age for the Buchan Caves, Murrindal, Jesse, Clermont and Reefton Limestones and the middle and upper parts of the Garra Formation.

Roemeripora sp. A

(Pl. 19, fig. 3)

A thin specimen (UQ F50721) from the early Couvinian? base of the China-man Creek Limestone Member, Broken River Formation, 3 miles north of Pan-danus Creek Homestead, North Queensland, and from which only one thin section was obtainable, resembles *R. progenitor* in size of corallites—3.1 to 4.5 mm in diameter. The corallites are cylindrical with walls up to 0.43 mm in thickness; in transverse section they are seen to be joined by thin tabulae developed in platform-like expansions of the wall. The inner tubes of neighbouring corallites communicate through pore-canals. Spinules are developed within the stereozone of the wall and on the tabulae. Offsets appear to arise from the periphery of mature corallites. This form probably represents a species distinct from the other Australian roemeripores.

Genus Roemerolites Dubatolov 1963

TYPE SPECIES (by original designation): *Roemerolites batschatensis* Dubatolov 1963, p. 59, Pl. 2, figs. 1, 2. Holotype, example 54 of collection No. 72 in the Geological Museum of the Institute of Geology and Geophysics of the Siberian division of the Academy of Science of the USSR, Novosibirsk. This specimen figured Dubatolov loc. cit., fig. 1a-g, is from the middle part of the Salairka beds of the Eifelian stage of the left bank of the R. Chernevoy Bachat, below Gur'cvska, on the south-west flank of the Kuznetsk Basin.

DIAGNOSIS: Corallum dendroid, but slender corallites contiguous and partly prismatic in early stage and in patches later; corallites with peripheral stereozone in which septal spinules are developed; tabulae very thin, irregularly infundibuli-form or concave; syrnix of neighbouring corallites may be continuous through pore-canals or connecting rounded tubules; offsets arise through openings of the pore-canals.

RANGE: Lower Middle Devonian (Salairka beds), Kuznetsk Basin, Siberia.

REMARKS: From the diagnosis this genus would appear to differ from *Roemeripora* only in the degree to which the corallites become divergent, so that it would seem reasonable to merge *Roemerolites* in *Roemeripora*. But Dubatolov's illustrations suggest that his type species might be even closer in its internal morphology to some species placed without doubt in *Syringopora*. Such difficulties of homeomorphology can only be properly resolved by study of the Kuznetsk material itself. We have herein placed the genus doubtfully in the synonymy of *Roemeripora*.

Genus *Armalites* Chudinova in Dubatolov 1963

Armalites Chudinova in Dubatolov 1963, p. 62.

Armalites Chudinova 1964, p. 63.

TYPE SPECIES (by original designation): *Armalites novellus* Chudinova in Dubatolov 1963; Chudinova 1964, p. 65, Pl. 32, Pl. 33, fig. 1. Holotype, Paleontological Institute of the Academy of Science of the USSR, Moscow, No. 1396/2586, from the Eifelian Shanda horizon, left bank of R. Ur, upriver from Novopesterevo, Kuznetsk Basin, Siberia, figured Chudinova 1964, *loc. cit.*, herein Pl. 19, figs. 6a, b.

DIAGNOSIS: Dendroid to sub-ceriod, with peripheral stereozone transversely wrinkled externally; septal spinules long, holacanthine, immersed in lamellar sclerenchyme of the stereozone in numerous radial longitudinal series and on the tabulae. Tabulae thin, infundibuliform with discontinuous syrx; pore-canals developed when corallites are contiguous, connecting tubules otherwise.

RANGE: Lower Middle Devonian, Salairka and Shanda Beds, Kuznetsk Basin.

REMARKS: The genus was placed in the Syringolitidae with *Roemeria*, *Roemeripora* and *Roemerolites* by Dubatolov, but Chudinova (1964) isolated it from these and referred it to the Syringoporidae, because of the similarity of the form of its corallum and the microstructure of its corallite walls and septal spinules. In our opinion, *Roemeripora* and *Roemerolites* have microstructure fundamentally similar to that of *Armalites* though less sharply expressed, and we find ourselves unable to refer only one of these genera to the syringoporids. Our study of the Australian *Roemeripora* indicates that *Syringopora thomii* Chapman, which shows microstructure identical to that of *Armalites*, lies within the range of variation of *Roemeripora progenitor* (Chapman). In considering *Armalites* we have been greatly assisted by photographs of the holotype of the type species sent to us by Mmc Chudinova and also by her comments and those of M. Dubatolov on photographs of Australian species we sent them.

Genus *Pseudoroemeripora* Koksharskaya 1965

Pseudoroemeripora Koksharskaya 1965, p. 88.

TYPE SPECIES (by original designation): *Pseudoroemeripora lenaica* Koksharskaya 1965, p. 89. Holotype, example 07 in collection number 205/17 of the Geological Museum of the Yakutsk filial of the Siberian division of the Academy of Science of the USSR at Yakutsk; from a limestone in the Lower Carboniferous Krestyakh conglomerate at Cape Krestyakh, at the mouth of the R. Lena, northern Kharaulakh; figured Koksharskaya 1965, Pl. 12, figs. 1a, 1b, 3.

DIAGNOSIS: Corallum small, turf-like. Corallites thick-walled, contiguous and prismatic or somewhat divergent and rounded. Mural (and corner) pores (in prismatic corallites) rounded, connecting tubules (between divergent corallites) short; tabulae favositoid or syringoporoid, in places grouped in relation to the

pores. Septa represented by plates peripherally that give off spinules axially. Increase intermural and peripheral.

RANGE: Lower Carboniferous of far north-eastern Asia.

REMARKS: While the growth form of the type species is like that of *Roemeripora bohemica*, the apparently poor development of syrinx-like proximal prolongations of the deeply concave tabulae and the statement of Koksharskaya that in the stereozone the septa are represented by radial longitudinal plates (not by discrete spinules in lamellar sclerenchyme) suggest that *Pseudoroemeripora* may be generically distinct from the French Lower Carboniferous species referred to *Vaughanites* by Paul and the Novaya-Zemlya species referred by Smirnova to *Roemeripora*.

Genus *Bayhaium* Langenheim & McCutcheon 1959

Bayhaium Langenheim & McCutcheon 1959, p. 99, Pl. 19, fig. 1-6.

TYPE SPECIES (by original designation): *Bayhaium merriamorum* Langenheim & McCutcheon 1959, p. 100, Pl. 19, fig. 1-6, from the lower and middle McCloud Limestone, Wolfcampian of Shasta County, California, U.S.A. Holotype, 37683, Museum of Paleontology, University of California, Berkeley, figd. *loc. cit.*, Pl. 19, figs. 2, 3, 5, 6.

DIAGNOSIS: Massively branching; in axial parts of branch corallites prismatic and thin walled; in peripheral parts the walls thicken and in places corallites may diverge slightly and become cylindrical; wall wrinkled transversely exteriorly to form tunnel-like inter-corallite connections into which wall pores open. Axial edges of septa project from the wall as low ridges. Tabulae thin, infundibuliform, somewhat irregular, seldom produced proximally into short axial tubes, grouped in relation to mural pores.

RANGE: Wolfcampian of California.

REMARKS: In its morphology this is closer to the Lower Devonian *Roemeripora bohemica* than to the lower Permian '*R.*' *wimani* Heritsch. The roemeriporoid morphology is now known from the Lower and Middle Devonian, Lower Carboniferous and Lower Permian, and raises the question whether all the generic names proposed for it are necessary. *B. merriamorum*, like *P. lenaica*, has septal ridges, and this may prove a distinguishing feature.

GENERA DOUBTFULLY REFERRED TO THE SYRINGOPORIDAE, POSSIBLY REPRESENTING A NEW SUBFAMILY

Genus *Pseudoroemeria* Chekhovich 1960

Pseudoroemeria Chekhovich 1960, p. 43.

TYPE SPECIES (by original designation): *Pseudoroemeria atbashiensis* Chekhovich 1960, p. 45, Pl. 3, fig. 1a-v. Holotype, No. 82/9207 in the Central Geological Museum in Leningrad, figured Chekhovich *loc cit.*, from the Lower Devonian, apparently Gedinian deposits of the R. Sherikty, in the Atbashinskiy range, Tien-Shan.

DIAGNOSIS: Corallum in places fasciculate, of slender cylindrical corallites with tabularia in communication through connecting tubules, in places cerioid, of prismatic corallites with tabularia communicating by mural pores; walls thin; septa represented by spinules; tabulae thin, horizontal, oblique or rarely weakly concave, never with axial tube.

RANGE: Lower Devonian (Gedinnian), Tien-Shan, Central Asia.

REMARKS: Chekhovich considered this genus to be a member of the family Syringolitidae, but with favositoid tabulae and with amalgamate prismatic corallites only in patches in the generally bushy corallum. Chudinova (1964, p. 16) suggested that *Pseudoroemeria* evolved from *Roemeria* by strong divergence of the corallites in parts of the colony, and that it gave rise to *Roemerolites*.

However, another possibility, that the morphological group formed by *Pseudoroemeria*, the upper Ordovician *Troedssonites* Sokolov 1947 (type species *Syringopora conspirata* Troedsson 1929, Pl. 43, figs. 2, 3, from Greenland) and the Lower Silurian (Llandoveryan) *Syringoporinus* Sokolov 1955 (*nom. nud.* 1947) (type species *Syringoporella irregularis* Chernyshev 1941, Pl. 12, fig. 6-7, from Taymyr) may form a cognate group, is suggested herein. All three have 'favositoid' tabulae, i.e. complete and not infundibuliform. *Troedssonites* has close slender cylindrical corallites connected by numerous short connecting tubules rather closely and regularly spaced; *Syringoporinus* has slender cylindrical corallites connected by sparse tubules with numerous new corallites arising by lateral increase from tubuli. *Troedssonites* and *Syringoporinus* were referred by Sokolov (1947, 1955) to the Syringoporidae. *Pseudoroemeria* differs from these two in its notable development of cerioid patches in the corallum.

Family NEOROEMERIIDAE Radugin 1938

Thecostegini de Fromentel 1861 (invalid vernacular name); NEOROEMERIIDAE Radugin 1938; THECOSTEGITIDAE Sokolov 1950.

DIAGNOSIS: Encrusting, subhemispherical or ramose; corallites slender, in early parts of colony or axial parts of branch may be adpressed and prismatic, communicating by mural pores; in later parts the corallites diverge but remain subparallel, and are united by irregularly tubular or platform-like tabulate expansions through perforations in the wall; these expansions may be contiguous vertically one with another or separated by spaces in which the corallites are not united. Wall microstructure of 'fibres' normal to the epitheca; septal spinules variably developed; tabulae thin, complete or incomplete, horizontal, concave or in places infundibuliform with the median notch drawn out into a short syrinx, which may be continuous with a similar but horizontal tube in the intercorallite expansions; the axial tubes may be crossed by small tabellae; tabellae may be grouped in relation to the mural pores.

RANGE: Late Ludlovian or Skala to Upper Devonian (Frasnian).

REMARKS: It appears to us that *Neoroemeria* differs from *Thecostegites* only in the clear evidence of a cerioid roemeriporoid habit in the axial parts of the branches, and we therefore bring the two together into this family which we place in the Syringoporidae next to the Roemeridae, from which it may have been derived.

Genus *Neoroemeria* Radugin 1938

Neoroemeria Radugin 1938, p. 83; Chudinova 1964, p. 20.

TYPE SPECIES: *Neoroemeria westsibirica* Radugin 1938, p. 84, Pl. 2, fig. 17; Givetian stage of the Middle Devonian of the Kuznetsk Basin. Holotype, a 73, from the environs of Lebedyanskoe.

DIAGNOSIS: Corallum massively branching, rarely plate-like or encrusting. In axial zone of branch corallites prismatic and adpressed, communicating by mural pores; in peripheral parts the corallites diverge and become cylindrical, but neigh-

bouring tabularia are in communication through irregular expansions of tubules extending from perforations in the wall, the expansions containing tabulae; septal spinules present, tabulae concave, convex, irregularly curving and becoming incomplete forming in places a very short axial tube; the tabulae may be grouped in relation to the wall perforations.

REMARKS: The peripheral parts of the branches of *Neoroemeria* are so similar in morphology to *Thecostegites* that it is difficult to agree with Chudinova that the resemblance is merely homeomorphic. Whether *Thecostegites* has a cerioid young stage in the colony is unknown. We prefer to group *Neoroemeria* with *Thecostegites* in the family Neuroemeriidae.

RANGE: Upper Middle Devonian of the Kuznetsk Basin.

Genus *Thecostegites* Edwards & Haime 1849

Thecostegites Edwards & Haime 1849, p. 261; Lecompte 1939, p. 169.

TYPE SPECIES (by monotypy): *Harmodites bouchardi* Michelin 1846, p. 185, Pl. 48, figs. 3a, b [*non* fig. 10 as stated in the text]. Upper Devonian, Frasnian; Ferques, near Boulogne, France.

DIAGNOSIS: Corallum massive and encrusting; corallites slender, cylindrical, thick-walled, united by successive irregular platform-like expansions of tabulate tissue, each expansion in communication with the tabularia through perforations arranged in verticals in the walls of the corallites; the expansions may be epithecate above and below; septal spinules irregular in development; tabulae in lateral expansions as well as in the cylindrical corallites, irregular, horizontal, oblique, concave, or with short axial tubes, which may be extended into the lateral expansions where they lie horizontally, and may be crossed by small tabellae.

RANGE: Late Ludlovian or Skalian of the Polar Urals, early Gedinian (upper Isfara horizon) of the Tien-Shan, Lower or early Middle Devonian (UT 51744, 51799) of Tasmania, Middle Devonian of North America and Middle and Upper Devonian of Europe and Asia.

Family CHONOSTEGITIDAE Lecompte 1952

CHONOSTEGITIDAE Lecompte 1952, p. 521.

DIAGNOSIS, RANGE, AND REMARKS: As for genus: see below.

Genus *Chonostegites* Edwards & Haime 1851

Chonostegites Edwards & Haime, 1851, p. 156, 299; Nicholson 1879, p. 152. *Haimeophyllum* Billings 1859, p. 139; Nicholson 1879, p. 152; type species (by monotypy) *Haimeophyllum inordinatum* Billings 1859, p. 139, fig. 39 on p. 140. Corniferous limestone [Emsian or Eifelian], Township of Walpole, Ontario, Canada. Billings' type material has not been identified in the collections of the Geological Survey of Canada, but Dr T. E. Bolton has loaned us a piece of specimen GSC 3444, collected by Murray 1860, and labelled 'Woodstock', which is 36 miles north-west of Walpole. Thin sections have been cut from this specimen, and are figured herein Pl. 20, fig. 2c-f. Nicholson (1879, p. 155) considered both *Michelinia intermittens* Billings 1859, p. 113 and *H. inordinatum* to be the same species as *Chonostegites clappi* Edwards & Haime. So far as we are aware, no thin sections have been made of the holotype (or lectotype) of either of these, but the very unusual external form seems identical and the suggested synonymy seems very likely to be correct and is accepted herein.

TYPE SPECIES (of *Chonostegites*): *Chonostegites clappi* Edwards & Haime 1851, p. 299, Pl. 14, figs. 4, 4a. Drift ex Devonian, Dayton, Ohio, U.S.A. What is probably the original of this figure has kindly been loaned to us by Dr P.

Semenoff of the Paris Museum of Natural History, and a photograph of a longitudinal thin section that we have prepared is given herein, Pl. 20, fig. 4.

DIAGNOSIS: Corallum phaceloid and cerioid in fairly regularly repeated alternation, with large pores through the thin common walls of the cerioid parts; septa represented peripherally by short spines and by other spines on the tabulae; tabulae thin, horizontal or low to tall domes, reinforced peripherally and in cerioid parts by large, dissepiment-like plates; in places tabulae may have an axial notch that may be extended as a short axial tube.

RANGES Emsian-Eifelian (Bois Blanc Formation to Moorhouse Member of Onondaga Limestone) of eastern North America. Dr W. A. Oliver, who kindly gave us this range, thinks it possible that more than one species may be involved. Lower-Middle Devonian of Urals and Tien-Shan (*vide* Sokolov 1962).

REMARKS: The systematic position of this genus is debatable. As Nicholson (1879) observed, its walls and mural pores and its larger inflated tabellae are very like those in some micheliniids. However, in parts of some corallites of *Chonostegites* short axial tubes may be found. This feature is found in the Syringoporidae, and the Syringolitidae and also in some Auloporidae. The possession of mural pores distinguishes the genus from the auloporoids, however. The development of tabulate expansions is found also in *Neoroemeria* and *Thecostegites*, which also have short tubes in places, and it seems to us that probably *Chonostegites* belongs in its own family or subfamily close to the *Neoroemeriidae*. Sokolov (1955) indeed placed it in the same family as *Thecostegites*.

Another genus with platform-like expansions connecting slender cylindrical corallites is *Cannapora* Hall 1892, p. 43; type species (by monotypy) *C. juniformis* Hall 1852, p. 43, Pl. 18, fig. 1a-f, from the Lower Silurian Clinton Group of Ontario, and New York. We have not seen this material.

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Explanation of Plates

PLATE 16

- Fig. 1-4—*Syringolites huronensis* Hinde, Llandoverian, Manitoulin Dolomite, near Manitouwaning, Manitoulin Island, Georgian Bay, Lake Huron, Ontario, Canada. 1. BM(NH) R19984, $\times 10$, calical view. 2. LECTOTYPE, BM(NH) R19950, $\times 2$; a. calical, b. lateral, views. 3. BM(NH) R19947; a. $\times 2$, b. $\times 7$, lateral views, c. $\times 2$, d. $\times 5$, thin transverse sections, e. $\times 2$, f. $\times 5$, thin longitudinal sections. 4. BM(NH) R19949, a. $\times 2$, b. $\times 10$, calical views.
- Fig. 5—'*Vaughnites*' *favositoides* (Vaughan) 1915, Lower Carboniferous δ Horizon (top of C₂ or bottom of S₁) *sublaevis* limestone of Avesnes district, France. Sedgwick Museum, E11401, HOLOTYPE, $\times 5$, thin transverse section.

PLATE 17

- Fig. 1-6—*Roemeripora progenitor* (Chapman). 1, 3-6. Lower Devonian, Lilydale Limestone, Cave Hill, Lilydale, Victoria; 2. Lower Devonian, Loyola Limestone, Loyola, near Mansfield, Victoria. 1. HOLOTYPE, specimen NMV P13199; a. $\times 5$, b. $\times 2$, thin transverse section NMV P17896, c. $\times 5$, d. $\times 2$, thin longitudinal section NMV P17897. 2. Holotype of *Syringopora thomii* Chapman, specimen NMV P13193; a. $\times 2$, b. $\times 5$, thin transverse section NMV P17899, c. $\times 2$, d. $\times 5$, thin longitudinal section NMV P17898. 3. NMV P15794; a. $\times 2$, thin transverse section, b. $\times 2$, c. $\times 4$, thin longitudinal sections. 4. UQ F4194; a. $\times 2$, thin transverse section, b. $\times 2$, thin longitudinal section. 5. NMV P26645; a. $\times 2$, b. $\times 5$, thin sections showing wrinkled epitheca and holacanthine spinules. 6. NMV P15799; a. $\times 2$, thin transverse section, b. $\times 2$, thin longitudinal section, showing wrinkled epitheca.

PLATE 18

- Fig. 1-4—*Roemeripora progenitor* (Chapman). 1, 2, 4. Late Lower or early Middle Devonian, Murrindal Limestone, Rocky Camp, Buchan, Victoria. 3. Lower Devonian, Lilydale Limestone, Cave Hill, Lilydale, Victoria. 1. UQ F57610, lower part of Murrindal Limestone; *a.* $\times 2$, thin transverse section, *b.* thin longitudinal section. 2. UQ F57611 lower part of Murrindal Limestone; *a.* $\times 2$, *b.* $\times 5$, thin transverse sections, *c.* $\times 2$, *d.* $\times 5$, thin longitudinal sections. 3. NMV P26041; *a.* $\times 1$, *b.* $\times 5$, calical views, *c.* $\times 2$, thin transverse section, *d.* $\times 2$, *e.* $\times 5$, thin longitudinal sections. 4. Holotype of *Roemeria ocellata* Hill, MU 1955, upper part of Murrindal Limestone; *a.* $\times 2$, thin transverse section MU 642, *b.* $\times 2$, thin longitudinal section MU 643.

PLATE 19

- Fig. 1, 2, 4, 5—*Roemeripora progenitor* (Chapman). 1. UQ F10273, late Lower or early Middle Devonian, Garra Formation, Wellington district, New South Wales; *a.* $\times 5$, *b.* $\times 2$, thin transverse sections, *c.* $\times 5$, thin longitudinal section. 2. GSV 47767, late Lower or early Middle Devonian, Buchan Caves Limestone, GSV Loc. 97, Buchan district, Victoria; *a.* $\times 2$, thin transverse section, *b.* $\times 2$, thin longitudinal section. 4. SU 28200, late Lower or early Middle Devonian, Reefton Limestone, south of Reefton, New Zealand; thin section $\times 2$. 5. UQ F50606, late Lower or early Middle Devonian, Jesse Limestone, Limekilns, 17 miles north of Bathurst, New South Wales; *a.* $\times 2$, *b.* $\times 5$, thin transverse sections, *c.* $\times 2$, *d.* $\times 5$, thin longitudinal sections.
- Fig. 3—*Roemeripora* sp. A. Early Middle Devonian, base of Chinaman Creek Limestone Member, Broken River Formation, 3 miles north of Pandanus Creek Homestead, North Queensland: UQ F50721, *a.* $\times 2$, *b.* $\times 5$, transverse sections.
- Fig. 6—*Arnalites novellus* Chudinova, late Eifelian, R. Ur, Kuznetsk Basin, USSR; HOLOTYPE, N1396/2586, Paleontological Institute of Academy of Science, USSR, Moscow, by courtesy of Mme I. I. Chudinova; *a.* $\times 7$, thin transverse section, *b.* $\times 7$, thin longitudinal section.
- Fig. 7—*Neoroemeria soshkinae* Chudinova, Givetian D₂, R. Mozalovskiy Kitat, Kuznetsk Basin, USSR. N1396/1243, Paleontological Institute of Academy of Science, USSR, Moscow, by courtesy of Mme I. I. Chudinova; $\times 5$, thin section.

PLATE 20

- Fig. 1—*Thecostegites bouchardi* (Michelin), UQ F38832, Frasnian, Ferques, near Boulogne, France; *a.* $\times 5$, thin transverse section, *b.* $\times 5$, thin longitudinal section.
- Fig. 2-4—*Chonostegites clappi* Edwards & Haime. 2. Geological Survey of Canada No. 3444, labelled *Haimophyllum ordinatum* Billings 1859; Emsian or Eifelian, Corniferous Limestone, near Woodstock, Ontario, Canada; *a.* $\times 1$, calical view, *b.* $\times 1$, lateral view, *c.* $\times 2$, thin transverse sections, *e.* $\times 2$, thin longitudinal sections. 3. BM(NH) R25637, labelled *Chonostegites ordinatus* (Billings); Devonian, Port Colborne, Ontario, Canada; *a.* $\times 2$, thin transverse section, *b.* $\times 2$, thin longitudinal section. 4. Probable HOLOTYPE of *C. clappi*, Ecole Nationale Supérieure des Mines, Paris; Drift ex Devonian, Dayton, Ohio, U.S.A.; $\times 2$, thin longitudinal section.